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Education, Engineering, Computers

NSF Stakes Out Major New Programs for 1984

The beginning of the federal fiscal year finds the National Science Foundation undertaking ambitious new activities in education, engineering, and several other fields. SGR discussed these developments on October 5 with Edward A. Knapp, who is nearing his first anniversary as Director of the Foundation. Following are major portions of that discussion, edited by SGR for brevity and clarity:

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SGR. You've reestablished the Foundation's Education Directorate. What's it going to do?

Knapp. We have an almost unique opportunity. Our budgets for science education were greatly reduced. The Directorate is only a skeleton at this time. We have an opportunity to see what was effective in the past, and at what levels programs can have an impact on the problem. Then we can put together a new program that takes all these things into account and emphasizes the connection that we have between scientists and the educators. The thing that NSF brings to the education problem that the other agencies of the government don't have is our very close connection to the scientific community. And the scientific community is very eager to get in and work on this problem. Now, we have to figure out a mechanism so that we can request proposals in such a way that the physics and chemistry departments and whoever can get together with educators in the schools of education of the universities and also in the hierarchies of the school systems around the country. We have to get these people together and somehow come out with proposals that really address the problems. The bulk of our work will be in two areas: one, in teacher training and one in materials development for teaching—for use in textbooks or software for computers.

Reagan Science Aide Outlines Agricultural R&D Design—Page 2

SGR. Will you support curriculum development?

Knapp. No, not necessarily curriculum development. There are people out there doing research on, for example, whether it's possible to teach in high school physics the concept of inertia, acceleration, mass, weight. This is complex. It's easy once you understand it, but it's difficult if you don't understand it. Are there ways to use, say, television, videodiscs, interactive computer systems in order to have a unit of physics which can teach that concept to a high school student? It's difficult to know whether an entire integrated curriculum is the right way to approach it.

SGR. Would the old Physical Sciences Study Curriculum developed in the 1960s with NSF support be of use today?

Knapp. It was successful for a while, but now is in use in fewer and fewer schools. The reason is that there's no mechanism right now to keep the teachers up to date in that particular system. Much of our problem gets back to the preparation of our teachers and the possibilities for them to be refreshed and updated. So, one of the things we will be doing will be workshops for teachers. I would like to see a couple of things emphasized that were emphasized before and that I think are very impor-

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In Brief

White House Science Adviser George A. Keyworth scoffs at the recent proposal to establish 2000 "exemplary" science and math schools or programs throughout the country—a key recommendation of the NSF-supported Commission on Precollege Education in Mathematics, Science and Technology (SGR Vol. XIII, No. 16). Keyworth told a press conference September 30, "I don't think it's possible. I don't think you will get a product that in any way resembles the level of excellence" at the Bronx High School of Science and other specialized schools cited by the Commission.

In its report on the NIH appropriations bill, the Senate Appropriations Committee says it is "concerned over the divisiveness that is developing as a result of continuing disagreement about indirect costs." It adds that "one method of establishing some sort of check on indirect costs would be to show on each grant award the indirect cost reimbursement associated with the grant." Though the scheme would accomplish nothing, the Committee directed NIH to start using it by next July 1.

IBM has launched a new program of support for untenured university faculty in computer and material sciences and related fields of engineering. The program provides two-year awards of $30,000 a year for 50 faculty members this year, 50 next year, and after that 100 a year. The aim is to keep scarce faculty from being lured away by high-paying industry.

Keyworth Urges Consolidation of Ag R&D Funds

Agricultural research, traditionally beyond the reach of the science-policy shakeups that presidents often attempt, has drawn an unprecedented amount of criticism from the Reagan White House, which contends ag science is relatively backward and unproductive (SGR Vol. XII, No. 12). That theme was sounded again on October 4, when White House Science Adviser George A. Keyworth II addressed the annual meeting of Agricultural Research Institute, in Arlington, Va. But this time, it was accompanied by something lacking in the past—a fairly detailed outline of the agricultural research system that the Administration would prefer to develop. Following are major excerpts from the address:

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I'm persuaded that there is great potential for unusual advances in agricultural research, but I'm less convinced that we're organized yet to take advantage of that potential. Much of the basic biological research up to this point has taken place out of the mainstream of agricultural research—at least in the sense that research often came out of academic biology fields and often at universities without strong agricultural interests.

Funding for the research was likely to have come from either the National Institutes of Health, particularly in animal biology, or, in the case of plant biology, from the National Science Foundation. In neither case do those organizations focus their efforts on agricultural research, so the spillover has been more a result of the interests of individual investigators.

This isn't to say that we aren't making important progress in agricultural research through these mechanisms. In fact, the mechanisms that these organizations use to fund basic research turn out in many ways to be more important to long-term agriculture interests than much more highly targeted programs of USDA. But I'm of the firm opinion that the best interests of US agriculture will be served if we can adapt those successful mechanisms within USDA.

I don't mean we should be thinking about displacing those strong programs that have been carrying these research interests in recent years. In fact, in the federal budget for fiscal year 1984, which began just this week, NSF's programs for basic research in plant biology rose by about 16 percent over the previous year, up to a level of about $50 million. And I'd look for comparable growth again next year. But what we really need is a substantial program of complementary research within USDA.

The key question before us is what mechanism we could use to make that happen. My own preference would be to try to build up programs that let all scientists compete for funds for agricultural research and training of students. We have a nucleus of such a program in the USDA competitive grants program, but it's only a nucleus. Its future depends heavily on how strongly the agricultural research community pushes for its growth.

And let me say very directly—I don't see any prospects for a large competitive grants program within USDA unless we can assure the broad agricultural community that such growth will not occur at the expense of ongoing research programs. Nor would I suggest that. For example, Hatch Act formula funds remain a *critical* element for stability of agricultural research institutions, providing the basic resources for salaries of researchers, for lab facilities, and—very important—for seed money for new research. My own feeling is that we have to assure some modest real growth in the formula funds; that's necessary to preserve and improve on the ability of the agriculture institutions to interact and respond to the needs of the community.

But that's not enough—not by a longshot. First of all, in absolute terms there's just not enough research funding, particularly unrestricted funding, available for agricultural research. In spite of the growing excitement about the possibilities for substantial progress, there's inadequate incentive for people to enter the field. It's just too much of a struggle to round up research support. I was told recently of the frustration of a first-class molecular biologist who moved into plant research only to find that he had to depend on *seven* different sources of funding to keep his research program. That's probably six more than he would need if he were in medical research.

So in addition to better formula funding, I'd like to see agricultural scientists be able to turn to single sources of major support within USDA. Funding from places like NSF, NIH, private foundations, and industry is important, but it often isn't geared to the driving interests of the agricultural researcher.

Anyone who's heard me before knows of my great confidence in the mechanisms and forces of competition to guide the wise allocation of resources. So my enthusiasm for a peer-reviewed competitive grants program in USDA comes as no surprise. But I also know that the pot has to be large enough relative to the number of qualified players to promise some reasonable chance of winning a hand now and then.

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...Textbook Work Poorly Disseminated in Past

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tant. If there are 1.4 million teachers in the school system, it's clear that NSF-sponsored workshops cannot touch all of them directly. But it would be nice if we could work it in such a way that perhaps master teachers or teachers who are very, very good could be trained and then pass on to others in their systems the training and materials that are talked about in some of our workshops. It would also be good in our materials-development programs if we could get textbook publishers involved in these developments and the concepts of the best methods of trying to put across certain points that are sticky in the teaching of science and mathematics. If we could get them involved early on—maybe at the time the proposals are written, there could be a linkup with the textbook publishers—we would have less difficulty with dissemination. I was talking to the president of a large textbook publishing firm the other night, and he basically said that the copyright laws at the time we were doing this work before were so stringent that his company never took any of the NSF output and put it into textbooks. He felt they were not sufficiently protected to make it into an operation where they could see any gain for themselves. It's a problem. Public monies develop programs that should be generally open to the public. On the other hand, if the interpretation of the copyright laws by the Foundation is such that we preclude anybody taking our material and using it, we have to think about it. We are actively looking into the problems of copyright inhibitions that might make the manufacturers of textbooks uninterested in the kinds of things that the NSF could-develop.

SGR. Would the aim be to give exclusive licenses?

Knapp. I don't know. The aim is to see that our materials get out into the public. I wouldn't say it's going to be exclusive licenses. I don't know what we'll come up with. I realize it's a touchy issue, and we're only now starting to study it. But it's important that the teachers get to use whatever we spend our money on.

Boost in Education Funds

SGR. What will the Foundation be spending on education?

Knapp. In the fiscal year that just started, Congress voted $75 million. I can't really talk about 1985, but I think our programs should be expanded.

SGR. Doubled?

Knapp. Double is probably more than we would go. There is certainly need for a program, but the question really revolves around how many really good proposals we get. Can we judge them, can we fund them, do we have the staff to do these programs in a very cost-effective way? Just expanding at an incredibly high rate could lead us into rather serious problems. I would like to feel my way a little bit. Going in just one year from $15 to $75 million is going to tax us pretty thoroughly. I'm really quite worried about that, in fact. But I think we're off to a good start. We're looking for a director, and I'm discussing with the White House and Congress whether the job should be one of the directorships that's

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AGRICULTURE *(Continued from page 2)*

As the situation stands now, the success rate is so low, and the potential research topics so restricted, that many scientists who would be anxious to participate just don't find it worth their while. So if we expect the competitive process to work, we have to increase the size of the program to attract a critical mass.

I would hope that such a program would be able to support at least five mechanisms, and I'll enumerate them. First, grants to spur development of agricultural research centers in these new fields and in proximity to ongoing research in non-agricultural areas of research; second, young investigator awards to help recruit bright new scientists into agricultural research; third, training grants to universities to permit support of graduate education; fourth, equipment grants to provide the sophisticated and expensive instruments and machines needed for today's science; and fifth, of course, investigator-initiated grants to respond to ideas from the research community...

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Editor and Publisher **Daniel S. Greenberg**
Associate Publisher **Wanda J. Reif**
Circulation Manager **Margaret Lee**

Contributing Correspondents
Christopher Joyce (Washington); Francois Seguier (Paris); Ros Herman (London)

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...New Computer Initiative to Aid Universities

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a presidential appointment. Either way, we'll poll all the interested organizations and get their nominations.

SGR. The Foundation is also putting a lot of additional support into engineering, but hasn't taken up the suggestion that it go all the way and make it the National Science and Engineering Foundation. Why not do that?

Knapp. I don't believe that changing the name would make any particular difference. What really makes a difference is what kind of programs you have inside the Foundation. The engineering community should look at our actions, not the words in the title. We would like to be an active and important participant in the health of engineering in this country. There's revolution in manufacturing techniques coming upon us, and I think universities have a serious role to play in the research that goes into developing for this country a really integrated manufacturing system. We have a responsibility for the health of science in this country. If we take on the responsibility for engineering in the same way, it's going to take new and more money.

SGR. Is there more money for engineering?

Knapp. Yes, and we are expanding in engineering and we think the future for engineering in the Foundation is good.

Social Sciences Included

SGR. Will support for the social sciences be coming back to where it was before this Administration took office?

Knapp. I think they're coming back toward that. Also, the social sciences themselves, because of the budget cuts, have rethought a good deal of what they do and the rationale for their research and the quantitative versus the qualitative nature of what they do. They're coming back with really quite good proposals in many, many areas. We have a computer initiative coming up this year, with funds that are already in the Foundation for fiscal 1984, which we think is important not only for the physical sciences; we think it's important for the social sciences, too. I don't know much about the analysis of social science data and the way you make models, but it would seem to me that when you get to serious nonlinear problems, that one of the ways you do this is with computer simulation with basically things like the Monte Carlo method and so on. There have been some reports of studies like this done with various models in some of the social sciences, which I think are quite exciting because it's a very nonlinear problem they're trying to solve, and it's a way to go. The data base work is very good.

SGR. What's the computer initiative?

Knapp. We would like to use a little of the money that we have this year for university access to largescale computing. We feel there's a tremendous vacuum out there. The initiative is for all the sciences, including the social sciences. It's interesting, too. There's a new proposal being talked about—we haven't received it yet—from Cornell, by Ken Wilson and a group of which he is one of the leaders, to develop a theory institute at Cornell. It's not based on a supercomputer. It's based more on the array processor approach to largescale computing. But he's talking about having the full range of sciences, including the social sciences, in his center. It's an attempt to try to unify the computer approach to the study of various problems in science. Rather than having something for physics, something for chemistry, and so on, they've put them all together. I think that's very, very exciting, that it could make a big difference in the kind of mathematical tools that the sciences use, it could provide for a big interchange of information between all the sciences on what techniques work and what don't

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NSF's Education Revival

With plenty of political paydirt suddenly visible in science education, the Administration has okayed reestablishment of the National Science Foundation's Science and Engineering Education Directorate—just 18 months after it wiped it out.

Purists might argue that the turnabout suggests election-season hypocrisy—especially since the Directorate will be operating on a plump $75-million budget that Congress forced on the Administration. But the resurrection satisfies so many clamoring constituencies that little attention is being paid to the bizarre spectacle of Reaganites warmly embracing a federal education role that they had pledged to abolish.

The Directorate will be headed on an acting basis by Laura P. Bautz, Director of NSF's Division of Astronomical Sciences. As NSF Director Knapp reports in the accompanying Q. and A., a search is underway for a full-fledged head of the Directorate, a post that carries the title of Assistant Director. Still to be settled is whether the job will be included in NSF's complement of four presidentially appointed assistant directors; several Foundation executives hold that title but are appointed by the NSF Director. Some pecking-order specialists say that presidential appointment carries more weight in bureaucratic politics, but then there are those who say it doesn't much matter.

...Science Foundation Head Looking for Help

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work for similarly modeled situations. But about the computer initiative: The point has been made many, many times that the scientists of all fields in universities really don't have access to the largest-scale computing power that's available in the country and that they really need to have it. What we would like to do over many years, starting in 1984, is develop at a few centers in universities around the country largescale computing equipment which would be connected through networks to universities with grantees in all the fields of the sciences.

SGR. Will you see the beginning of that in 1984?

Knapp. Yes. We'll be receiving applications and there will be some initial funding. There are some centers out there which, if they had a little impetus, could perhaps develop a little more equipment or consulting capability to get people started. The reason these things haven't worked particularly well on a commercial basis is that usually the entire structure isn't there. It takes more than a piece of hardware. It takes people who understand how to use it, it takes a good network, good graphics, a lot of equipment, and it takes a good mechanism of interaction between the center where the computer is and the university where the user is; interaction not only with graphics feedback, but interaction with a consultant at the center who can work with the graduate students. A lot of university people in some of the physical sciences use the facilities at Los Alamos, Livermore, Sandia, and other places, where they have personal contacts and do joint work with the people who are there. In fact, Los Alamos has a thousand outside users who can telephone in. But that's not enough and it doesn't cover all the sciences.

SGR. How much will you spend on this in 1984?

Knapp. We're talking about $9 million to start on this, depending on whether we can get everything together. We've gotten started, and we're talking to the National Science Board about it. It's a plan for money that we have in the budget right now from all the directorates. It's money that was earmarked for computing in each directorate, but it wasn't pulled together for one program.

Indirect Costs

SGR. NSF and NIH use the same rates for calculating indirect costs on research, but NSF is at peace on this subject while the NIH Director insists that the costs are excessive. Why the difference between NSF and NIH on this issue?

Knapp. I don't know very much about the indirect-cost issue. I know that it's sort of a mess, in that each university has its own way of calculating indirect costs, so the rates vary because they include different things. My feeling is that the overheads costs of doing research should be accurately determined and should be part of the cost of doing business. Those costs should be picked up by the NSF. The problem has been that these costs have escalated in recent years rather dramatically. I don't have an opinion as to whether we should try to make uniform the code under which indirect costs are calculated, or whether we should limit to certain vlaue the possible charging of indirect costs.

Lists of Candidates

SGR. You've had some major staff vacancies here for the better part of a year? What's holding up the appointments?

Knapp. I'm working very hard on this. We've been delayed by major changes in the White House personnel office. I'm working very diligently with Dr. (George) Keyworth (the President's Science Adviser) and other people in the Administration to try to get some people here. I think things are going relatively well in the Foundation, but I would like to have some people here to help me. I asked people to leave so that I could build my own team, and I've been building now for quite a few months, and I still haven't been completely successful.

SGR. Is there a list of candidates attached to each vacancy?

Knapp. Yes, there has been for some time. Each vacancy has a list of candidates, and then, of course, there have been more candidates added by various people who feed into the White House. We're working together to try to get excellent scientists and people acceptable all around for these jobs.

SGR. Is the White House personnel office considering candidates whose names did not originate here?

Knapp. Yes, I think there are nominees of Congress, there are nominees from the (President's) Science Adviser, there are nominees from here, and I feel confident that we're all working together.

SGR. Has it been indicated whether your approval will be required for whomever they pick?

Knapp. I would presume it would be. I think it's understood.

SGR. Are there any signs of when these people will be selected? It often takes an appointee some time to settle up his affairs and move to Washington.

Knapp. I can't set a date, but I'm pushing fairly hard right now personally. I'm working on it, really quite hard to try to get things to happen.

SGR. The Congressional Research Service has produced a surprisingly favorable assessment of parapsychology as a subject worthy of research (SGR Vol.

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France: Difficult Days at Pasteur Institute

Paris. The Pasteur Institute is among the rare exceptions to the backwardness of the life sciences in France, where biology laboratories tend to be poorly equipped and supported. But for all the quality of its research, which accounts for most of France's Nobel prizes, the renowned Institute has fared poorly in the worldwide rush to commercialize biotechnology. And lately it has been embarrassed by newspaper revelations concerning its development of the hepatitis B vaccine.

At the beginning of the summer, the daily *Liberation* published investigative reports that showed the Institute had used at least some blood imported from the US for the preparation of the vaccine. With the first wave of the AIDS scare then hitting France, the use of American blood—whatever the actual risks might have been—caused a wave of consternation among French biologists and physicians. Commerce in human blood is viewed with abhorrence here. The *pastoriens* were roundly denounced.

The second stumble concerned the Institute and its competitor in the hepatitis vaccine market, the American firm Merck, Sharp & Dohme, which employs a different manufacturing process. In July, the Institute and the company attempted to persuade the World Health Organization (WHO) to endorse their vaccines. When the WHO looked askance at the adversely publicized Pasteur product, the Institute's directors accused the WHO of bias toward the American product. WHO responded that the Institute had failed to make public its manufacturing processes and test procedures.

This silence with regard to the international organization seemed a bit contemptuous—an attitude French administrators assume quite easily—especially since Merck, Sharp & Dohme had provided all the necessary information to facilitate endorsement. By August it was all over—the American vaccine had conquered the world. The only place left was China, which could still choose the French vaccine. If China picks it, she will produce it herself, under French license, and the Pasteur researchers will not have been disgraced.

The Pasteur researchers are even more irritated and angered by the WHO endorsement affair because their own work was above suspicion. The responsibility for this faux pas falls entirely on the businessmen and the Institute's administration, and more exactly on the branch which the Institute had created, Pasteur Institute Production (IPP), together with a nationalized industrial group (SANOFI). By institutionally separating research and production, they also distanced them geographically. The attitudes of the two groups rapidly become more and more opposed. "Researchers" and "developers" had resorted to communicating via notes. And the business types called the scientists the "rabid" ones, a not too delicate allusion to Louis Pasteur's historic discovery.

This animosity was not without cause. Many of the researchers want to break off relations with the industrial branch. They feel the businessmen have established their incompetence beyond doubt as this wasn't the first time that the developers for the IPP have suffered a defeat on the world market. They looked like amateurs, and this angered the researchers who feel the quality of their work is among the highest. It also angered the government, which had touted this structure as an ideal combination of an independent basic research lab and a development and sales subsidiary guided by a nationalized enterprise. Will this be the final setback for the enterprise? The "rabid" ones from the labs want to take the "Pasteur" label from the subsidiary and manage their patents by themselves offering them to the highest bidder.

Stratis Avrameas, one of the scientists at Pasteur who has registered the greatest number of patents, says that "of the patents which Pasteur has registered in my name

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KNAPP *(Continued from page 5)*

XIII, No. 16). How would you react to an application for support of that kind of research, which many people regard as plain nutty?

Knapp. It may be of interest to someone but it hasn't hit the Director's office.

SGR. What would happen to an application if it arrived here?

Knapp. I'm not certain what routing the mail service would take for that, what program we would put it under. I think it would get scrutiny. It wouldn't be dismissed out of hand. It would be looked at carefully. Maybe there are good scientific studies. I'd have to look at the proposal.

Rockefeller U. Appoints Counsel

William H. Griesar, the New York attorney who represented West Germany's Hoechst Corp. in setting up a Department of Molecular Biology at Massachusetts General Hospital, has been appointed Vice President and General Counsel of The Rockefeller University. The Hoechst deal, announced in 1981, is one of the biggest of the new breed of industrial linkages to non-profit research institutions.

An announcement from the university quotes Rockefeller President Joshua Lederberg as stating, "We are fortunate to be able to draw on William Griesar's broad legal background in an era of ever more complex interactions with government and industry."

...Industry Cool on Academic Connections

(Continued from page 6)

over 10 years, not one has been developed." According to Avrameas and to the research directors, a laboratory like Pasteur should have at least 5 large pharmaceutical companies as regular clients. The biologists insist that their science remains strong, and that they're the victims of amateur businessmen. They note, for example, that a team working both at the National Center for Scientific Research (CNRS) and at Pasteur has apparently made progress toward identifying the agent for AIDS. This immunodeficient syndrome is rather rare in France, but the *pastorean* researchers have hopes of making up for their economic sins.

But in France, despite the speeches made by the government, the captains of industry are not rushing to team up with scientists who are touchy about their independence.

It was within this context of industrial indifference, that the Minister for Industry and Research, Laurent Fabius, has announced plans for constructing a "biotechnologies building" on the Pasteur campus. This has certainly cheered up the *pastoreans*—since the placing of such a building in the heart of Paris will be done in the face of otherwise strict zoning regulations.

"Biotechnologies" and "capitalist ventures" have become a slightly magical combination for those who dream of a rapid growth in advanced biotechnological research. French researchers have been demanding funds to create such ventures for a long time. The Genentech model is a cause of envy (only one biotechnology venture-capital company exists in France, Transgene, and even there the money is controlled by the Government).

To fan the hopes, Minister Laurent Fabius has added all the ingredients of Socialist government mythology, including construction of the biotechnologies building, one of the main pieces of a "mobilization project" intended to make French public and private-sector researchers work together. The problem is that France serves only 7 percent of the world market with its products; to serve 10 percent by 1990, it would have to increase the number of specialists from 800 today, to 2500 in 1985. This is recorded as almost impossible. The other main piece of Laurent Fabius' credo is the creation of an "international network of biotechnologies" in partnership with England. This type of bilateral cooperation, which has not been seen since the Concorde supersonic project,was proposed by a study group set up after the Western leaders economic summit in Versailles in 1982, and was ratified after Williamsburg summit, this year.

The sudden rush to catch up in biotechnology is reminiscent of France's years of futile on-and-off efforts to achieve a place in the electronics marketplace. However, Fabius, the young minister of Industry and Research, is not fainthearted. Of the six primary goals that he has declared, the topmost is a financial boost for biotechnology, which is to receive a 30-percent budget increase next year.

Many observers contend that it is far too late in the day to catch up with far-ahead American and accelerating Japanese biotechnologists. It is also felt that the Pasteur experience suggests some basic problems that have more to do with business attitudes than any intrinsic difficulty in bringing products to market.

All this may be so. But aspirations to scientific and technological distinction remain a centerpiece of the Mitterrand government's policy.—FS.

ASM Board Member Quits Over Indirect-Cost Statement

Efforts by university administrators to retain high overhead rates on federally financed research have drawn a new protest.

This one is by C.D. Cox, Professor of Microbiology at the University of Massachusetts, Amherst, who last week resigned the chairmanship of a committee in the 35,000-member American Society for Microbiology. His action was in protest against ASM associating itself with a move by university administrations to stonewall reform of the overhead system. Cox went out on the same issue that last month inspired the resignation of Walter Ellis, Public Affairs Director of the Federation of American Societies for Experimental Biology (SGR Vol. XIII, No. 16).

Cox, was a member of ASM's Public and Scientific Affairs Board and chairman of the Society's Medical Microbiology and Immunology Committee. In a letter to ASM President Harlyn Halvorson, he wrote that ASM's endorsement of a statement drafted by Donald Kennedy, President of Stanford, and Lattie Coor, President of the University of Vermont, was at "cross-purposes with the best interests and support of ASM members active in research."

OTA Aide Takes New Post

David Banta has left the Congressional Office of Technology Assessment, where he was Assistant Director for Health and Life Sciences, to become Deputy Director of the Pan American Health Organization.

Senate Follows House in Boosting NIH Funds

	1983 Budget	Reagan '84 Budget	House	Senate
Cancer	962,581,000	963,881,000	1,044,868,000	1,062,017,000
Heart, Lung, and Blood	595,736,000	609,248,000	665,859,000	683,489,000
Dental	75,191,000	76,944,000	84,398,000	84,398,000
Arthritis, Diabetes, and Digestive and Kidney Diseases	393,457,000	406,505,000	442,255,000	442,832,000
Neurological and Communicative Disorders and Stroke	287,361,000	292,345,000	328,921,000	322,083,000
Allergy and Infectious Diseases	270,311,000	280,809,000	307,128,000	304,228,000
General Medical Sciences	321,013,000	338,255,000	363,444,000	370,245,000
Child Health and Human Development	244,859,000	247,295,000	265,180,000	264,847,000
Eye	138,001,000	138,748,000	149,600,000	151,966,000
Environmental Health Sciences	158,061,000	160,565,000	173,627,000	172,374,000
Aging	91,578,000	97,240,000	112,516,000	108,584,000
Research Resources	213,209,000	201,117,000	253,824,000	230,031,000
Fogarty International Center	10,147,000	9,189,000	11,584,000	11,088,000
Subtotal	3,761,505,000	3,822,141,000	4,203,032,000	4,208,182,000
Library of Medicine	44,802,000	41,963,000	42,263,000	41,963,000
Building and facilities	17,500,000	19,900,000	24,980,000	25,100,000
Office of the Director	25,748,000	26,720,000	26,779,000	26,720,000
Total, National Institutes of Health	3,849,555,000	3,910,724,000	4,297,054,000	4,301,965,000
Unauthorized, not considered	(175,838,000)	(166,368,000)	DEFER	DEFER

Generous House treatment of the National Institutes of Health budget for fiscal 1984 (which began October 1) was followed on October 4 by slightly more generous treatment in the Senate, as can be seen in the accompanying table. The "defer" relates to training programs for which renewal of authorizing legislation is still in the Congressional mill. The two houses still must confer to iron out the differences in their bills, but the inevitable outcome will be one of the biggest budget increases for NIH in recent years:

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300 N. Zeeb Rd
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